Point-Slope Form

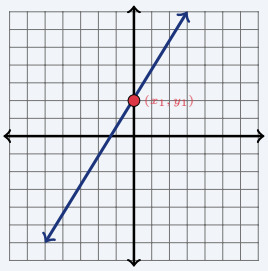
Name: _____	Date: _____	Score: _____ / 18

Quick Review and Helpful Hints

Point-slope form is $y - y_1 = m(x - x_1)$, where m is the slope and (x_1, y_1) is a known point. Substitute the slope and point, then distribute and simplify to slope-intercept form $y = mx + b$ if needed.

▷ **Example:** Write the line through $(2, 5)$ with slope 3. **Work:** Point-slope: $y - 5 = 3(x - 2)$. Distribute: $y - 5 = 3x - 6$. Add 5: $y = 3x - 1$.

★ **Answer:** $y = 3x - 1$



$y - y_1 = m(x - x_1)$.

Practice Problems

Write each line in slope-intercept form $y = mx + b$.

1. slope 2 through $(1, 4)$ _____
2. slope 3 through $(2, 5)$ _____
3. slope -1 through $(0, 3)$ _____
4. slope 4 through $(1, 1)$ _____
5. slope -2 through $(3, 0)$ _____
6. slope 1 through $(2, 5)$ _____
7. slope 5 through $(0, -2)$ _____
8. slope -3 through $(1, 4)$ _____
9. slope 2 through $(-1, 3)$ _____
10. slope $\frac{1}{2}$ through $(4, 5)$ _____
11. slope -1 through $(5, 2)$ _____
12. slope 3 through $(-2, -1)$ _____
13. slope 2 through $(0, 0)$ _____
14. slope -4 through $(1, -2)$ _____

Word Problems

15. A line has slope 2 and passes through $(3, 7)$. Write its equation in slope-intercept form. _____
16. A delivery fee is linear. The cost is $\$2$ for 1 mile and $\$6$ for 3 miles. Write the equation of the line through these points. _____
17. A line passes through $(2, -3)$ with slope -1. Write its equation. _____
18. A plumber charges a base fee of $\$5$ and then $\$4$ per hour. Write the linear equation with slope 4 and point $(0, 5)$. _____

Answer Keys

1. $y = 2x + 2$	**7.** $y = 5x - 2$	**13.** $y = 2x$
2. $y = 3x - 1$	**8.** $y = -3x + 7$	**14.** $y = -4x + 2$
3. $y = -x + 3$	**9.** $y = 2x + 5$	**15.** $y = 2x + 1$
4. $y = 4x - 3$	**10.** $y = \frac{1}{2}x + 3$	**16.** $y = 2x$
5. $y = -2x + 6$	**11.** $y = -x + 7$	**17.** $y = -x - 1$
6. $y = x + 3$	**12.** $y = 3x + 5$	**18.** $y = 4x + 5$

Step-by-Step Explanations

1. Start by naming the process: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 4 = 2(x - 1) = 2x - 2$, so $y = 2x + 2$. So the final answer is $y = 2x + 2$.

2. A good way to think about this is: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 5 = 3(x - 2) = 3x - 6$, so $y = 3x - 1$. So the final answer is $y = 3x - 1$.

3. Step by step: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 3 = -1(x - 0) = -x$, so $y = -x + 3$. So the final answer is $y = -x + 3$.

4. Take it one move at a time: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 1 = 4(x - 1) = 4x - 4$, so $y = 4x - 3$. So the final answer is $y = 4x - 3$.

5. Start by naming the process: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 0 = -2(x - 3) = -2x + 6$, so $y = -2x + 6$. So the final answer is $y = -2x + 6$.

6. A good way to think about this is: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 5 = 1(x - 2) = x - 2$, so $y = x + 3$. So the final answer is $y = x + 3$.

7. Step by step: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y + 2 = 5(x - 0) = 5x$, so $y = 5x - 2$. So the final answer is $y = 5x - 2$.

8. Take it one move at a time: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 4 = -3(x - 1) = -3x + 3$, so $y = -3x + 7$. So the final answer is $y = -3x + 7$.

9. Start by naming the process: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 3 = 2(x + 1) = 2x + 2$, so $y = 2x + 5$. So the final answer is $y = 2x + 5$.

10. A good way to think about this is: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 5 = \frac{1}{2}(x - 4) = \frac{1}{2}x - 2$, so $y = \frac{1}{2}x + 3$. So the final answer is $y = \frac{1}{2}x + 3$.

11. Step by step: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 2 = -1(x - 5) = -x + 5$, so $y = -x + 7$. So the final answer is $y = -x + 7$.

12. Take it one move at a time: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y + 1 = 3(x + 2) = 3x + 6$, so $y = 3x + 5$. So the final answer is $y = 3x + 5$.

13. Start by naming the process: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 0 = 2(x - 0) = 2x$, so $y = 2x$. So the final answer is $y = 2x$.

14. A good way to think about this is: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y + 2 = -4(x - 1) = -4x + 4$, so $y = -4x + 2$. So the final answer is $y = -4x + 2$.

15. Step by step: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 7 = 2(x - 3) = 2x - 6$, so $y = 2x + 1$. So the final answer is $y = 2x + 1$.

16. Take it one move at a time: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is Slope $= \frac{6-2}{3-1} = 2$. Then $y - 2 = 2(x - 1)$, so $y = 2x$. So the final answer is $y = 2x$.

17. Start by naming the process: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y + 3 = -1(x - 2) = -x + 2$, so $y = -x - 1$. So the final answer is $y = -x - 1$.

18. A good way to think about this is: Start with point-slope form, distribute if needed, and isolate y to write the final equation. The setup/work is $y - 5 = 4(x - 0) = 4x$, so $y = 4x + 5$. So the final answer is $y = 4x + 5$.

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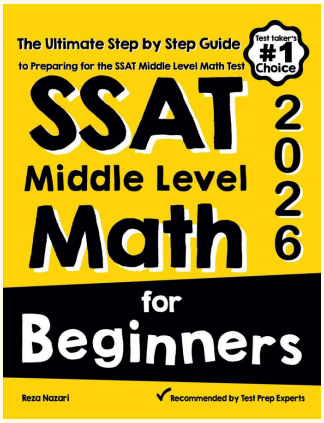

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